

ABSTRACT

A marine vehicle propulsion system is provided that combines a fuel cell electrical source for an AC propulsion motor for a marine vessel with an electrolyzer and a DC-AC converter. The fuel cell provides power for the AC propulsion motor. When the fuel cell is depleted, the DC-AC converter is disconnected from the AC propulsion motor and is reconnected to an AC power source from a host ship, and the power electronic DC-AC converter is disconnected from the fuel cell and reconnected to the electrolyzer. The fuel cell is replenished by operating the electrolyzer device that runs using DC power from the host ship to separate water into hydrogen gas and oxygen gas. The power electronic drive is operated in reverse to power the electrolyzer from the host ship.